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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/688,364	10/17/2003	William Freeman	15436.30.1	2301

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EXAMINER
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MENEFEE, JAMES A

ART UNIT	PAPER NUMBER
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2828

DATE MAILED: 05/30/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/688,364

Applicant(s)

FREEMAN ET AL.

Examiner

James A. Menefee

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 20 March 2006.  
2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.  
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-36 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.  
6) ☒ Claim(s) 1-34 and 36 is/are rejected.  
7) ☒ Claim(s) 35 is/are objected to.  
8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.  
10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)  
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)  
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.  
4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.  
5) ☐ Notice of Informal Patent Application (PTO-152)  
6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Response to Amendment***

By amendment filed 3/20/2006, claims 1, 7, 16, 24, and 32 are amended, and claims 33-36 added. Claims 1-36 are pending.

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claim 36 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. There is no suggestion in the application that light is directed from the variable Faraday rotator back to the first Faraday rotator. That is, the claim requires light to go through the first Faraday rotator to the second variable Faraday rotator (in parent claim 32), then be directed to a third polarizing element that is between the first and second variable Faraday rotator (in claim 36); thus the light is directed back from the second variable Faraday rotator to a polarizing element between the rotators. It seems that the word "variable" in line 2 of claim 36 should be deleted; thus light will only travel in one direction through the system, consistent with the specification.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-15 and 33-34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Onaka et al. (US 5,867,300) in view of Liu et al. (US 6,580,546). For Onaka, see Fig. 13 and discussion thereof unless otherwise noted, though the entire document is relevant.

Regarding claim 1, Onaka discloses an optical attenuator comprising at least one polarizing element 10 having an optical polarization axis, wherein the polarizing element transmits a portion of an incident light signal 5 proportional to the angular difference between an optical polarization axis of the incident light signal and that of the polarizing element, and a variable faraday rotator (including yoke, FR, and coil 64 around the yoke). It is not disclosed that a conductive wire is disposed around at least a portion of a semi-transparent material. Liu teaches as in Fig. 6 that a Faraday rotator may include a semitransparent material 101, a magnetic material 101 for applying a magnetic force to a beam of light through the transparent material, and a conductive wire 102 disposed around at least a portion of the semi-transparent material and configured to induce a magnetic field on the magnetic material when a current is applied through the wire. It would have been obvious to one skilled in the art to use Liu's Faraday rotator in place of Onaka's Faraday rotator in order to enhance the latching effect as described in Liu col. 1 lines 24-37, and prevent leakage of the magnetic field as described in col. 5 line 59 – col. 6 line 2. Note that Onaka's rotator is similar to the compared prior art rotator in Liu Fig. 1.

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Regarding claim 2, the polarizing element 10 comprises a polarizer having a linear optical property.

Regarding claim 3, Onaka describes in the discussion of the prior art that semi-transparent material is typically a garnet. Col. 3 lines 31-36. Onaka does not appear to discuss the material of Faraday element elsewhere, thus it may be presumed to be the same in Onaka's invention as in the prior art. This interpretation is reasonable, since Onaka describes a garnet as having unwanted wavelength dependence on rotation, *id.*, and one of the purposes of Onaka's configurations is to remove such dependence, *id.* at col. 3 lines 65-67. Onaka does not purport to remove such dependence by changing the material, so it is presumed the material remains a garnet. See also Ser. No. 08/704,946 (now US 5,812,304), incorporated by reference by Onaka at col. 8, and which describes such a semi-transparent material as a garnet. '304 at col. 6 lines 47-53. Furthermore, Onaka's rotator is replaced by Liu's rotator; Liu's transparent material is explicitly garnet. Col. 4 lines 38-42.

Regarding claim 4, Onaka's magnetic material 62,66 comprises a permanent magnet portion 66. It is known in the art that a permanent magnet is a hard ferromagnetic material.

Regarding claim 5, in Liu's obvious Faraday rotator, the semi-transparent material 101 is at least partially enclosed in the magnetic material 104 (which surrounds 101 and can be said to "enclose" it).

Regarding claim 6, conductive wire 102 is a coil wrapped around the magnetic material .

Regarding claim 7, Onaka and Liu teach the first polarizing element and variable faraday rotator as in the above rejection of claim 1. Onaka further discloses a second polarizing element 30 that also transmits a portion of incident light proportional to the angular difference in

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polarization between the polarization axis of incident light and that of the second polarization element.

Further regarding claim 7, and regarding claims 8 and 15, it is not disclosed that the device is a laser or transceiver package and that the source is a laser or the specific lasers of claims 8. Onaka does disclose as in prior art Fig. 28 (see discussion in col. 1) that variable optical attenuators are typically used where the input signal is a laser diode (i.e. a generic semiconductor laser). The transmitter and receiver system of Fig. 28 can further be called a transceiver. It would have been obvious to one skilled in the art to use Onaka's variable optical attenuator in the system of prior art Fig. 28, rather than the typical optical attenuator, because it diminishes wavelength and temperature dependence of the attenuation, as taught by Onaka in col. 3 lines 65-67. It would additionally have been obvious to use Liu's rotator in Onaka's attenuator for the reasons noted above in the rejection of claim 1.

Regarding claim 9, it is not disclosed the laser is a DFB laser. As noted above, the laser is disclosed as a laser diode; DFB lasers are a type of laser diode, and it would have been obvious to one skilled in the art to use such a laser because it may be easily tuned to provide a desired output at a particular wavelength as is known.

Regarding claims 10-14, see the rejections of claims 2-6 above.

Regarding claims 33-34, the claimed shape of the semi-transparent material is not disclosed. That the material be cylindrical does not appear significant. It has been held that a change of shape may be obvious to one skilled in the art where the shape has no significance. *See In re Dailey*, 357 F.2d 669, 149 USPQ 47 (CCPA 1966) (holding that the configuration of the claimed disposable plastic nursing container was a matter of choice which a person of ordinary

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skill in the art would have found obvious absent persuasive evidence that the particular configuration of the claimed container was significant.). Thus, the change of shape here would have similarly been obvious to one skilled in the art.

Claims 16-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Onaka in view of Liu, and further in view of Uchida et al. (US 4,178,073).

Independent claims:

Regarding claim 16, Onaka discloses as in Fig. 20 an input light source from 92, an isolator 93, and an attenuator 96. The attenuator can be the device of Fig. 13. Col. 19 lines 54-58. The device of Fig. 13, combined with the teachings of Liu as noted above, includes the variable faraday rotator as claimed followed by a polarizing element. See the rejection of claim 1 above. Thus the variable faraday rotator as claimed and the third polarizing element are disclosed. There is not disclosed the first polarizing element, faraday rotator, and second polarizing element as claimed.

Uchida teaches in Fig. 1 that an isolator may include a first polarizing element 21, a faraday rotator including semi-transparent material 22 and magnetic material 26-27 at least partially surrounding the partially transparent material, and a second polarizing element 25. It would have been obvious to one skilled in the art to replace isolator 93 of Onaka with Uchida's isolator because it is polarization independent and provides little loss, as taught by Uchida. See col. 1 line 64-68.

Thus, with Uchida's isolator in place of Onaka's isolator 93, there is taught the first polarizing element as claimed, the faraday rotator as claimed, and the second polarizing element

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as claimed (all replacing 93), and then the variable faraday rotator and the third polarizing element as claimed (as part of attenuator 96).

Finally, it is not disclosed that the device is a laser package, but this is obvious in Onaka. See the above rejection of claim 7.

Regarding claim 24, the claim is taught similarly to claim 16 above. The claims only differ in that claim 24 omits the polarizing element between the faraday rotator and the variable faraday rotator. Thus all the elements are taught as in the above rejection of claim 16.

Dependent claims:

Regarding claims 17-20, 22-23, 25-28, and 30-31, these limitations are either taught or disclosed by Onaka/Liu as in the above rejections.

Regarding claims 21 and 29, the magnetic material 26-27 of Uchida's isolator is disclosed as permanent magnets.

Claims 32 and 36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Onaka in view of Uchida et al. (US 4,178,073).

Regarding claims 32 and 36 (as understood, see 112 rejection above), Onaka discloses as in Fig. 20 an input light source from 92, an isolator 93, and an attenuator 96. The attenuator can be the device of Fig. 13. Col. 19 lines 54-58. The device of Fig. 13 includes the variable faraday rotator as claimed followed by a polarizing element. See the rejection of claim 1 above. Thus the variable faraday rotator as claimed and the third polarizing element are disclosed. There is not disclosed the first polarizing element, faraday rotator, and second polarizing element as claimed.



Uchida teaches in Fig. 1 that an isolator may include a first polarizing element 21, a faraday rotator including semi-transparent material 22 and magnetic material 26-27 at least partially surrounding the partially transparent material, and a second polarizing element 25. It would have been obvious to one skilled in the art to replace isolator 93 of Onaka with Uchida's isolator because it is polarization independent and provides little loss, as taught by Uchida. See col. 1 line 64-68.

Thus, with Uchida's isolator in place of Onaka's isolator 93, there is taught the first polarizing element as claimed, the faraday rotator as claimed, and the second polarizing element as claimed (all replacing 93), and then the variable faraday rotator and the third polarizing element as claimed (as part of attenuator 96).

The first polarizer will also transmit at least a portion of light proportional to the angular difference between an optical polarization axis of the light signal and that of the first polarizer.

Finally, it is not disclosed that the light is a laser, but this is obvious in Onaka. See the above rejection of claim 7.

### *Allowable Subject Matter*

Claim 35 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. There is not taught or disclosed in the prior art an optical attenuator including inter alia a magnetic material wrapped around a cylindrical semi-transparent material, and a conductive wire wrapped around the magnetic material.

*Response to Arguments*

Applicant's arguments with respect to the claims have been considered but are moot in view of the new grounds of rejection. The arguments are mainly drawn to the newly added limitation that a wire is disposed around the semi-transparent material of the rotator. This is addressed in the new rejections above.

Applicant's arguments with respect to claim 32 are noted, but applicant has merely added elements to make the claim similar to old claim 16 (i.e. with a second Faraday rotator), therefore the rejection is modified as such.

All new rejections are made due to applicant's amendments, therefore this action is made final.

*Conclusion*

The other references cited are pertinent to applicant's invention.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

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however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to James A. Menefee whose telephone number is (571) 272-1944. The examiner can normally be reached on M-F 8:30-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, MinSun Harvey can be reached on (571) 272-1835. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



James Menefee  
May 25, 2006